KPDES FORM SDAA

Kentucky Pollutant Discharge Elimination System (KPDES)

Socioeconomic Demonstration and Alternatives Analysis

The Antidegradation Implementation Procedure found in 401 KAR 10:030, Section 1(3)(b)3 requires KPDES permit applications for new or expanded discharges to waters categorized as "Exceptional or High Quality Waters" to conduct a socioeconomic demonstration and alternatives analysis to justify the necessity of lowering local water quality to accommodate important economic or social development in the area in which the water is located. This demonstration shall include this completed form and copies of any engineering reports, economic feasibility studies, or other supporting documentation

I. Project Information

Facility Name: Kronos Mine (DMRE Permit #892-0108)

Location: 3.3 miles west of the junction of KY 69 & KY 85 and 0.1 miles northwest of the junction of KY 69 & Matanzas Road	**County: Ohio**

Receiving Waters Impacted: Williams Creek

II. Socioeconomic Demonstration

1. **Define the boundaries of the affected community:**
(Specify the geographic region the proposed project is expected to affect. Include name all cities, towns, and counties. This geographic region must include the proposed receiving water.)

The proposed project is located in Ohio County on the north side of KY 69 approximately 3.3 miles west of the junction of KY 69 and KY 85 and 0.12 miles northwest of the junction of KY 85 and Matanzas Road at latitude 37°24'22" and longitude 87°04'16". The total surface area of the project is 368.5 acres. The nearest community is Centertown, KY which is located 1.2 miles east of the proposed project. Two unnamed tributaries of Williams Creek are the receiving streams for the proposed discharges and are tributaries of Green River.

2. **The effect on employment in the affected community:**
(Compare current unemployment rates in the affected community to current state and national unemployment rates. Discuss how the proposed project will positively or negatively impact those rates, including quantifying the number of jobs created and/or continued and the quality of those jobs.)

The October 2009 unemployment rate in Ohio County was 9.1%. The statewide rate was 11.2% and the national rate was 10.0%. The change in Ohio County's unemployment rate has increased 3.1% from October 2008 – October 2009. The increase is comparative to a statewide increase of 4.3% and a national increase of 3.4%. Recent trends reflect an increase in unemployment in Kentucky compared to an increase nationally. Ohio County reflects a decrease of 0.3% compared to a statewide increase of 0.2% and a national change of 0.0% from September 2009 – October 2009. All rates are sourced from the Kentucky Office of Employment and Training. The proposed project will positively impact the unemployment rates stated. Approximately 60 workers will remain employed exclusive from the 90 indirect workers who will remain employed. The average weekly wage for mining employees in Ohio County in 2009 was $884.00 (Kentucky Office of Employment and Training).

II. Socioeconomic Demonstration- continued

3. The effect on median household income levels in the affected community:

(Compare current median household income levels with projected median household income levels. Discuss how proposed project will positively or negatively impact the median household income in the affected community including the number of households expected to be impacted within the affected community.)

The median household income for Ohio County in 2008 was $27,820 per annum. Based on the Kentucky Office of Employment and Training, the 2009 average weekly income for each of the 60 miners to be employed is $844.00 and the average weekly wage for other workers in the county is $535.00. Thus the total income would bring an annual increase of $2,758,080 in purchasing power for Ohio County and surrounding areas.

Generally, Ohio County as a whole would be positively impacted by the increase in revenue that this project would bring about. Employees would have a more secure place of employment and higher than average income. The families in these 60 households will be economically sustained. Their purchasing power would have a trickle down effect in reversing the unemployment trend for other workers in the region of the proposed project.

4. The effect on tax revenues of the affected community:

(Compare current tax revenues of the affected community with the projected increase in tax revenues generated by the proposed project. Discuss the positive and negative social and economic impacts on the affected community by the projected increase.)

This project will provide approximately 60 jobs and will provide indirect employment opportunities in mining related industries including equipment sales and parts, transportation, food services, fuel sales, and office and maintenance supplies. Ohio County permits local taxation on real estate, finished goods, and other tangible properties. The taxies are levied at the following rates per $100.00: &0.199 for real estate and $0.2402 for tangible property. This project will also contribute directly to Ohio County's economy through severance taxes. Based on an annual coal production of 150,000 tons per year at $55.00 per ton, the project would contribute approximately $148,500.00 per year in coal severance tax for the county (150,000 tons x $55.00 per ton x 4.5% x 40% = $148,500.00). The proposed project will utilize the use of this selected class of property and this will be additional money for health services, judicial services, and infrastructure projects to better serve the citizens. Schools will benefit because the increased property taxes would ensure better equipment, facilities, and better pay for teachers.

II. Socioeconomic Demonstration- continued

5. The effect on an existing environmental or public health in affected community:
(Discuss how the proposed project will have a positive or negative impact on an existing environmental or public health.)

A portion of the project area has been previously mined and timbered and left abandoned with no reclamation. The entire permit area will be reclaimed following the conclusion of mining. This will provide an enhanced habitat and environment. During reclamation, all permitted areas will be stabilized to prevent erosion. Species indigenous to the area will be planted to establish adequate vegetation and runoff from all re-graded areas will be diverted into sediment ponds to prevent sedimentation to nearby streams. Following reclamation, the permit area will be in better condition than existed prior to mining. This will provide a healthier habitat for aquatic species and wildlife leading to a more balanced ecosystem. Additionally, recovery of the coal will increase coal severance tax revenues, which will be returned to the community. The money will be used for environmental protection such as sewage disposal, sanitation, and solid waste disposal, which will have beneficial effects on the existing environment.

6. Discuss any other economic or social benefit to the affected community:
(Discuss any positive or negative impact on the economy of the affected community including direct and or indirect benefits that could occur as a result of the project. Discuss any positive or negative impact on the social benefits to the community including direct and indirect benefits that could occur as a result of the project.)

This project will require other supporting jobs as well as mining jobs. Equipment sales and repair, mining/engineering consultants, and fuel/transportation providers will be needed as a result of this project. The combination of these jobs and the taxes collected because of it will spur community development by the creation of more jobs in Ohio County and other surrounding communities. It will also provide additional revenue to the businesses of the area which are already in existence. There is the potential of 60 direct jobs and 90 indirect jobs created as a result. The increased payment of property taxes will be for the improvement of the county. The additional mining should increase the coal severance tax money the county receives and this would subsequently increase the tax base for Ohio County.

After mining is completed, the area will be utilized for pasture, hay production, and outdoor recreation activities. Reclamation has the potential of enhancing the habitat of the local flora and fauna, thus increasing Ohio County's land value.

III. Alternative Analysis

1. Pollution prevention measures:
(Discuss the pollution prevention measures evaluated including the feasibility of those measures and the cost. Measures to be addressed include but are not limited to changes in processes, source reductions or substitution with less toxic substances. Indicate which measures are to be implemented.)

The pollution prevention measures to be implemented for this project include keeping gradients and inclines to the active pit as short as possible in order to minimize the amount of drainage going to the active surface mining site, construction of on-site diversions to convey water around disturbed areas to sediment ponds that would otherwise flow through the disturbed area thus increasing the amount of the sediment from the permitted area.

Other measures would include covering or treating potential contamination producing materials so as to minimize adverse effects on water quality, minimizing the disturbed surface area that is open at one time and implementing sedimentation controls, routing and segregation or combination of wastewater and mine runoff to minimize the effect on the quality of the receiving streams i.e. unnamed tributaries of Williams Creek.

2. The use of best management practices to minimize impacts:
(Discuss the consideration and use of best management practices that will assist in minimizing impacts to water quality from the proposed permitted activity.)

See Attachment III.2

3. Recycle or reuse of wastewater, waste by-products, or production materials and fluids:
(Discuss the potential recycle or reuse opportunities evaluated including the feasibility of implementation and the costs. Indicate which of, of these opportunities are to be implemented)

See Attachment III.3

The proposed project would implement the recommended BEST Management Practices for mining operations in Kentucky. The water and sediment control strategies would be preplanned. The sediment ponds would be sized to accommodate a 25 year/24 hour storm event. The ponds will be placed on the outer edges of the permit area in order to capture all runoff from the permit area. Existing vegetation would be retained where feasible. Any disturbed streams will be reconstructed in their approximate location and gradient and vegetated with trees, shrubs, and grasses or other herbaceous species to protect surface water from soil runoff and mining contaminants.

BMP structures would be inspected after each significant rainfall event and corrective actions taken immediately, if erosion or soil runoff is observed. The runoff will be diverted away from disturbed areas to prevent any adverse effect on water quality as a result of increase in turbidity or total suspended solids. All denuded areas which are not actively being mined would be vegetated and/ or mulched. Local materials and native plant species would be selected for reclamation.

Any sediment which results from exposed earth during periods of significant rainfall should be trapped on site. The length and steepness of the slopes on site would be minimized, the runoff velocity would be minimized, and buffer or filter strips may be left between land disturbances and natural waterways.

The average yearly rainfall is approximately 45 inches. Based on the standard 1 inch of rain over 1 acre of land being equal to 27,154 gallons of water over the proposed 368.5 acres approximately 450,281,205 gallons of precipitation would be received per year. Approximately 75% of the annual precipitation (337,710,904 gallons) will result in runoff.

Water is an integral aspect in mining operations as far as misting/spraying the area to help alleviate airborne dust. Nonetheless, the amount of water required for dust suppression is minimal compared to the amount of precipitation and discharge generated. Water used for dust suppression is generally only required during dry times of the year. Approximately 15,000 gallons of water would be needed for dust suppression per day. Storm water captured in the sediment ponds can be used for refilling water trucks, which would be used for dust suppression activities. There are not other facilities on site (such as a preparation plant) that will require a raw water source.

Using water from this project for onsite dust suppression was proposed. Watering of reclaimed areas is not proposed due to the size of the area and the cost of constructing an irrigation system. The slope of the area ranges from 0.5% to 25%. The reclaimed area will have a slope greater than 6% which makes irrigation impractical due to the rate of absorption. The permit area consists of sediment ponds, diversion ditches and roads. The remaining permit area will be reclaimed and vegetated after mining is completed. Current reclamation practices have demonstrated that irrigation of reclaimed areas is not necessary when seeding and/or mulching are preformed at the proper time. An irrigation system would require a water wheel, a minimum of 5000 feet of pipe, 3 water pumps, and miscellaneous spray heads, fittings, couplings, etc. at an estimated cost of $150,000.00

Construction of a lake for recreational purposes was also evaluated as a possible alternative. This would involve acquisition of land, environmental and engineering surveys, designs, and permits, and construction of a dam, at the very least. The estimated cost of this alternative is approximately $40,000,000.

III. Alternative Analysis - continued

4. Application of water conservation methods:
(Discuss the potential water conservation opportunities evaluated including the feasibility of implementation and the costs. Indicate which of, of these opportunities are to be implemented)

Effective implementation of some aspects of the use of best management practices to minimize impacts (as stated previously) would be effective and instrumental in ensuring water conservation. The effective sizing of the sediment ponds to accommodate a 25 year/24 hour rainfall event would ensure that waste water which overflows is stored. Ponds will be situated at locations which ensure that they function at their optimum. Runoff would be diverted from disturbed areas to ensure that water is diverted to the sediment ponds prior to discharging off the permitted area.

Other options are available to conserve water quality. They include using reverse osmosis filtration systems, a system of thickeners and vacuum cleaners among others. These alternative options are not practical because they require extra cost, additional site disturbance, power lines and increased operating costs. The average cost for a reverse osmosis plant capable of handling 5000 gallons of water is $2.9 million dollars. This cost is not practical for this proposed project.

5 Alternative or enhanced treatment technology:
(Compare feasibility and costs of proposed treatment with the feasibility and costs of alternative or enhanced treatment technologies that may result in more complete pollutant removal. Describe each candidate technology including the efficiency and reliability in pollutant removal and the capital and operational costs to implement those candidate technologies. Justify the selection of the proposed treatment technology.)

See Attachment III.5

Several alternatives to treating water from the project area and discharging it to streams in the area have been evaluated. These alternatives include construction of a water treatment facility, construction of filter barriers, chemical treatment of drainage, and construction of wetlands.

Water Treatment Facility

Construction of a small water treatment facility (500,000 gallons per day) on the project site would cost over $1.5 million dollars plus an addition cost for the construction of a containment reservoir. Because of the high cost of construction, the short life of the proposed operation, and the large amount of water to be treated (337,710,904 gallons) it is estimated that it would cost over $3.4 million dollars per year (337,710,904 gallons x $0.01 per gallon) to treat the runoff. A water treatment facility is also not practical since its main purpose is to pre-treat to remove microbial contaminates and not particulate matter in storm runoff.

Filter Barriers

Silt fences and straw bales would not be able to handle the large discharge flow generated nor would they meet the requirements of Kentucky's surface mine regulations as stated in 405 KAR 16:070.

Chemical Treatment

Chemical treatment of drainage was also considered. The primary treatment required at this site is the removal of sediments, which would require the use of ponds or dugouts to hold the water while the soil and debris settle out. Chemicals may be used to augment this process, but sediment removal is not possible using chemical treatment alone. It would not be cost effective to treat the entire amount of discharge at this site.

Wetland Construction

Constructed wetlands have traditionally been used for biological treatment. However, the discharge generated by this operation will require sedimentation control measures and wetlands are not effective for treating sediment. Additionally, wetlands used for water treatment would require additional property (approximately 4 acres) that would have to be flat by nature which is not available in this particular area. It would cost approximately $100,000 to construct the wetland site if the property was available.

III. Alternative Analysis - continued

6. Improved operation and maintenance of existing treatment systems:
(Discuss improvements in the operation and maintenance of any available existing treatment system that could accept the wastewater. Compare the feasibility and costs of improving an existing system with the feasibility and cost of the proposed treatment system.)

The storm water will be maintained in sediment structure prior to discharge. This will allow settling to occur so that lowering of water quality will be minimized based on applicable regulations concerning discharges from the project site. It is not feasible to store the water on-site, dispose of it below the surface or construct a treatment facility for a short term project. Accepting lower water quality standards would create additional burden and cost to this project. In order to lower the standards larger ponds would have to be built. For the ponds this means more disturbances in streams, larger volumes of water stored in the ponds, and higher construction/removal costs (approximately $15,000 per structure). Avoiding this project is not a viable option as the advantages to the economic development of Ohio County would not be realized. Jobs would be lost, the tax base would diminish, and local business would not prosper. Based on U.S. Department of Labor, Bureau of Labor Statistics, the average for all industries in the U.S. is $782.00 per week. While in Ohio County the average weekly wage is $535.00, only 68.4% of the national wage. The average weekly wage for mining employees in Ohio County is $884.00 and is one of the highest paying industries in the local area. Therefore, if this project does not materialize the loss of the 60 direct jobs and 90 indirect jobs would drive the economy down by $101,900.00 per week or $5,261,800.00 per year.

7. Seasonal or controlled discharge options:
(Discuss the potential of retaining generated wastewaters for controlled releases under optimal conditions, i.e. during periods when the receiving water has greater assimilative capacity. Compare the feasibility and cost of such a management technique with the feasibility and cost of the proposed treatment system.)

This project proposes to construct sediment ponds to ensure controlled release of generated wastewater under optimal conditions. The capacity of the physical, chemical, and biological processes to assimilate is interconnected and based on the features of the streamscape (the stream, flood plain, and riparian zone). Even though the removal of natural features i.e. vegetative cover may compromise the abilities of Stream Assimilative Process, construction of the sediment ponds mitigate the impact. The ponds retard the velocity of the storm water thus enhancing sediment filtering and reducing its deposition. The settling ponds would be sized to accommodate a 25 year/24 hour storm event and ponds will be placed downstream of the disturbed area.

III. Alternative Analysis - continued

8 Land application or infiltration or disposal via an Underground Injection Control Well

(Discuss the potential of utilizing a spray field or an Underground Injection Control Well for shallow or deep well disposal. Compare the feasibility and costs of such treatment techniques with the feasibility and costs of .proposed treatment system.)

Onsite and subsurface disposal options are not feasible alternatives. The installation of a sanitary septic system, (i.e. septic tank) was evaluated but is not an applicable option. Building a system large enough to handle the volume of water would be impractical. The typical septic tank will only hold 1,000 gallons. This project could produce up to 1,473,511 gallons per hour during peak discharge for a 10 yr/24 hr storm event. With this anticipation, it would require well over 1,474 septic systems with drain fields up to an acre for each system. This site will not have adequate useable space that this number of systems could be placed. Septic systems are designed to digest organic waste and biodegradable material over time by anaerobic digestion. While this source water would most likely contribute some organic material and some needed bacteria, this would be inadequate to decompose the sediment and would work essentially the same as a sediment pond. Also the possibility of drilling an injection well (to inject the discharges underground) depending on depth could cost up to $50,000 per well. Injecting this discharge underground would increase the potential of an outcrop blowout from an old unknown adit and would require a UIC permit. A suitable place to inject, which the applicant has surface and/or mineral leases and/or deeds that covers a nearby underground mine does not exist. In addition to potential safety impacts associated with the subsurface disposal, this alternative would reduce the quantity of water available to support downstream aquatic communities.

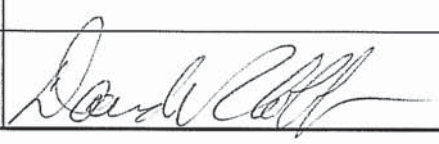
9 Discharge to other treatment systems

(Discuss the availability of either public or private treatments systems with sufficient hydrologic capacity and sophistication to treat the wastewaters generated by this project. Compare the feasibility and costs of such options with the feasibility and costs of the proposed treatment system.)

It would cost approximately $1,340,000 (20,000 feet of 24" HDPE pipe at $67/ft) to run 24" HDPE pipe to the nearest downstream municipal water treatment plant, which is in Centertown, Kentucky. The Centertown treatment plant would then require a sediment basin to remove the silt before allowing the water to enter the plant.

The trucking of runoff from a potential 10 yr/24 hr storm event to a treatment facility was considered. The runoff from mine site is estimated at 35,364,254 gallons of waste water from the 24 hour event. Assuming the use 6000 gallon capacity tanker trucks for hauling, the trucking of this volume of water would require 5,894 tanker truck loads to remove this volume of water in a 24 hour period. It is estimated that the time to pump into the tanker, round trip haul, and unloading time at the treatment plant is approximately three hours. It would require 737 trucks with a capacity of 6,000 gallons each working 24 hours a day, to haul the discharge to the treatment plant. The trucks would cost approximately $169.51 million ($230,000 per truck), and the maintenance and diesel would cost over $532,750 per day ($201,753,750 per year) for an annual cost of $371,263,750.

IV Certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and Title:	**David R. Cobb, Secretary**	**Telephone No.:**	(270)821-0987
Signature:		**Date:**	**4-20-10**